



Hour of Code 2021 – Activity Guide

Xtrail

Workshop Outline

The objective is to build a cross country biking game where the player will ride around the trail.

Learning Objectives:

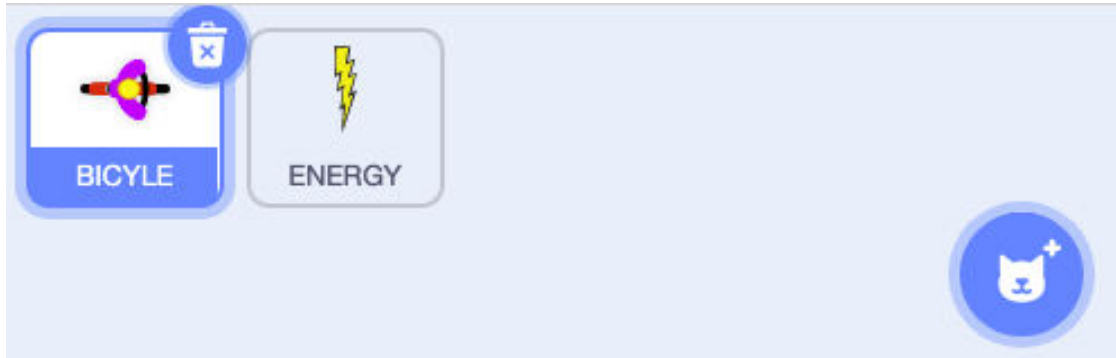
- Familiarity with the Scratch environment: sprite, stage and scripts
- Motion: Using the **keys** to control the main character movements
- Interaction: Sensing a specific color and sprite
- Use of variables to keep track of different values
- Creating and using functions

Materials and resources:

- Scratch Account (Recommended)– Scratch info [link](#) – Account info [link](#)
- Scratch starter project – [LINK](#)
- Scratch completed project – [LINK](#)

Let's Code

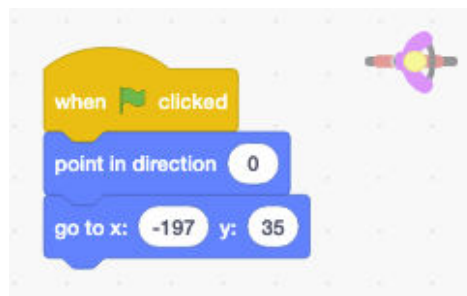
We have provided for you in the starter project a background, a Bicycle sprite, and an Energy sprite. Once you are done coding the project with the provided items, feel free to change the way they look, replace them with some items of your choice, or draw a new Track.



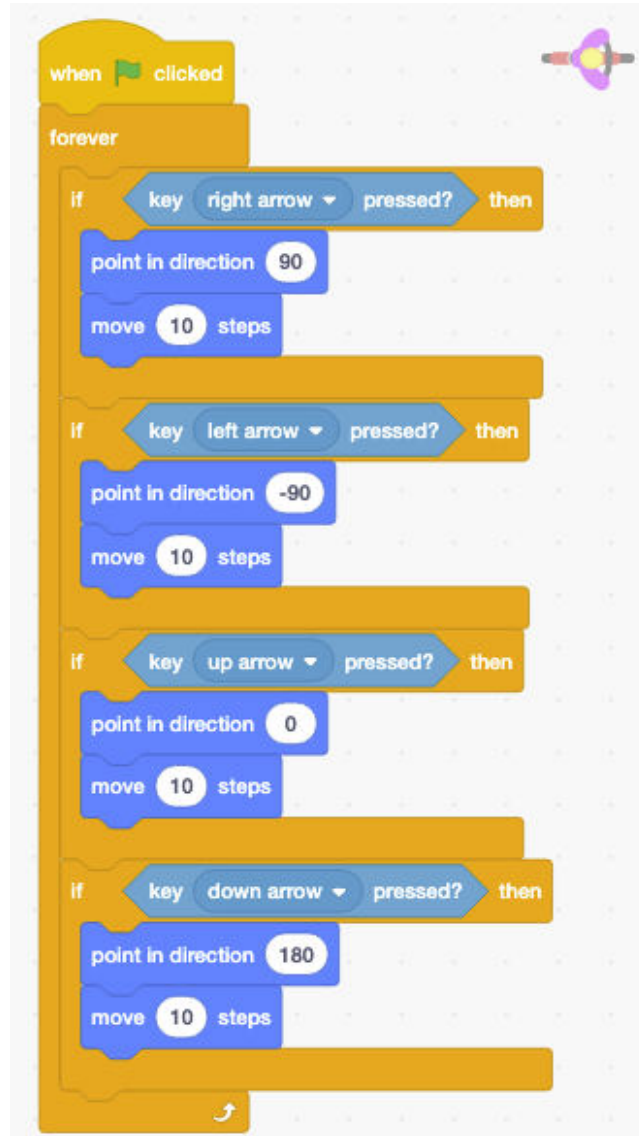
Coding the Bicycle Sprite

We are going to create four sets of blocks for the Bicycle Sprite.

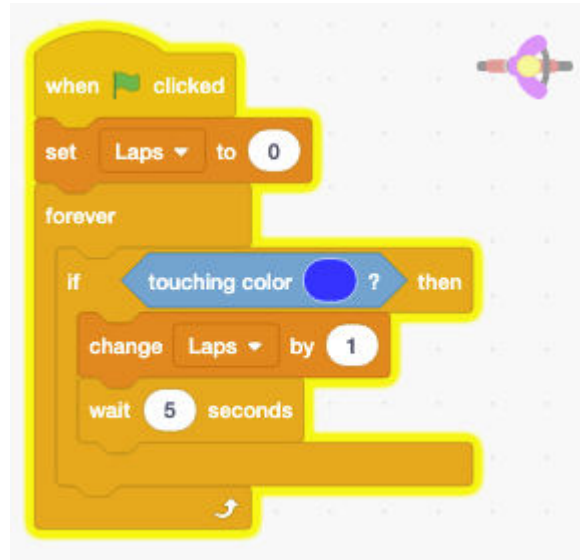
1. Set the initial position and direction:



2. Add the code that detects arrow keys pressed and move the Bicycle Sprite in that direction:

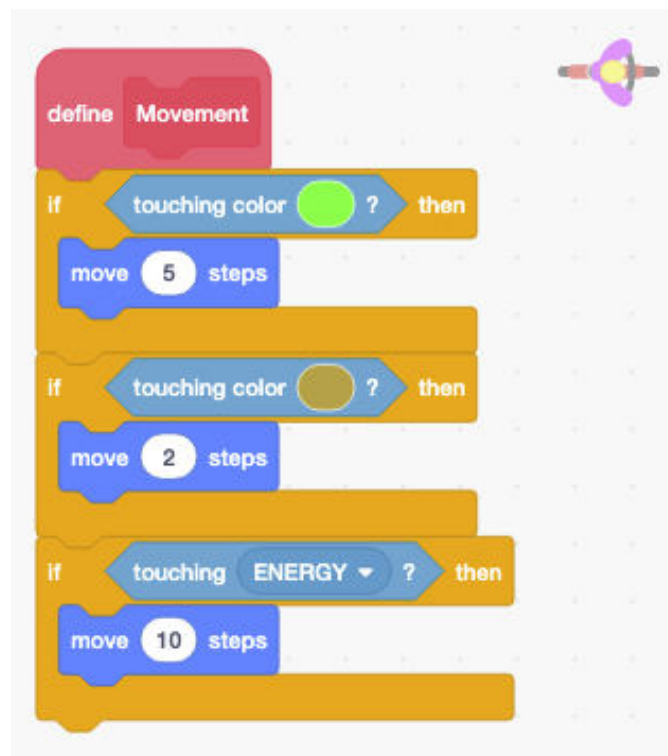


3. To keep track of the number of laps we need to create a variable and increase it each time the bicycle crosses the blue line. Why do you think we added a **wait 5 seconds** block?



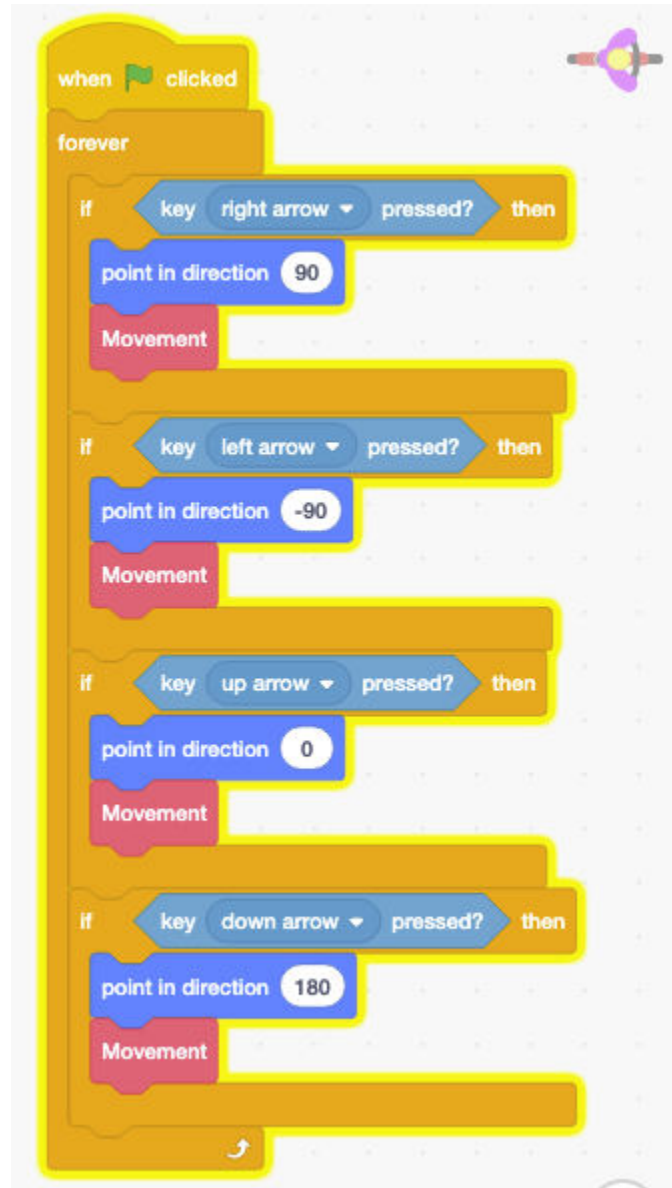
```
when green flag clicked
  set Laps to 0
  forever loop
    if touching color blue ? then
      change Laps by 1
      wait 5 seconds
```

4. The code we have makes the game functional, but we want the bicycle to go faster on the track (green area) and slower outside of it (brown area). We'll do this by creating a **Function (My Blocks)**. A function is a block that groups a set of instructions. Let's do it!



```
define Movement
  if touching color green ? then
    move 5 steps
  if touching color brown ? then
    move 2 steps
  if touching ENERGY ? then
    move 10 steps
```

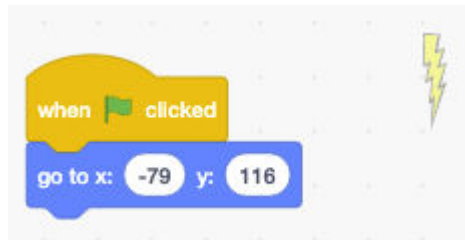
5. Now we can use our new **Movement** block in our previous code. Change the set of blocks that controls the Bicycle movement to look like this:



Functions are very important in coding as they help you create code that is easier to read, they can be easily reused in other projects and they help you find problems faster

Coding the Energy Sprite – Power Up!

The purpose of the Energy Sprite is to provide a speed boost to the Bicycle Sprite each time they touch. To achieve this result we already added the code that moves the Sprite 10 steps in our **Movement** function block. All that is left to do is to set the position of the Energy Sprite on the Stage when the game starts.



Great work! You have created a Bike racing game using Scratch. Try some of these extensions:

Extensions

1. Add multiple Energy Sprites along the track
2. Use the same idea of the Energy Sprites to create items that will slow down the Bicycle
3. Add a timer that ends the game after 2 minutes
4. How would you have a friend play with you instead of the computer
5. Create new tracks by adding Costumes to the background